WHAT IS CLAIMED IS:

1. A fuel injection system for an internal combustion engine starting time, comprising:

a plurality of cylinders; and

a controller which sets an amount of fuel injected into each cylinder sequentially in a first cycle of fuel injection during a normal engine start where an engine speed increases, such that an amount of fuel to be injected into one of the cylinders in a last injection within the first cycle is larger than an amount of fuel to be injected into another one of the cylinders in a first injection within the first cycle.

2. The fuel injection system according to claim 1, wherein the controller sets the fuel injection amount for each of the cylinders in the first cycle such that an amount of fuel to be injected into any one of the cylinders is not smaller than an amount of fuel which is injected into a different one of the cylinders at an earlier time during the first cycle.

3. The fuel injection system according to claim 2, wherein the controller progressively increases an amount of fuel to be injected into each cylinder at each injection during the first cycle.

4. The fuel injection system according to claim 3, wherein the controller progressively reduces an amount of fuel to be injected into each cylinder at each injection in a second cycle following the first cycle.

5. The fuel injection system according to claim 1, wherein the controller sets an amount of fuel to be injected into each cylinder such that a total amount of fuel injected from the first cycle to a predetermined subsequent cycle is the same for all the cylinders.

6. The fuel injection system according to claim 5, wherein the controller progressively reduces the amount of fuel to be injected into each cylinder in each cycle from the first cycle to the predetermined subsequent cycle.

7. The fuel injection system according to claim 6, wherein a total amount of fuel to be injected into each cylinder is a function of a parameter which affects evaporation of the injected fuel, and the total amount of injected fuel decreases as the parameter changes in a direction that promotes the evaporation of the injected fuel.

8. The fuel injection system according to claim 7, wherein the parameter is a temperature of an engine coolant, and the total amount of the injected fuel decreases as the temperature of the engine coolant increases.

9. The fuel injection system according to claim 7, wherein the parameter is at least one parameter selected from an opening amount of an intake passage control valve provided in an intake port, a valve overlap amount between an intake valve and an exhaust valve, an assist air amount of an air assist type fuel injection valve, a temperature of fuel to be injected, and a temperature of intake air.

10. The fuel injection system according to claim 1, wherein a difference between an amount of fuel to be injected into the one of the cylinders in the first injection of the first cycle and an amount of fuel to be injected into the another one of the cylinders in the last injection of the first cycle is a function of a parameter which affects evaporation of the injected fuel, and the difference decreases as the parameter changes in a direction that promotes the evaporation of the injected fuel.

11. The fuel injection system according to claim 10, wherein the parameter is a temperature of an engine coolant, and the difference in the fuel injection amount decreases as the temperature of the engine coolant increases.

12. The fuel injection system according to claim 10, wherein the parameter is at least one parameter selected from an opening amount of an intake passage control valve provided in an intake port, a valve overlap amount between an intake valve and an exhaust valve, an assist air amount of an air assist type fuel injection valve, a temperature of fuel to be injected, and a temperature of intake air.

13. The fuel injection system according to claim 1, wherein an increasing rate of an amount of fuel to be injected into the one of the cylinders in the last injection of the first cycle with respect to an amount of fuel to be injected into the another one of the cylinders in the first injection of the first cycle is a function of a parameter which affects evaporation of the injected fuel, and the increasing rate decreases as the parameter changes in a direction that promotes the evaporation of the injected fuel.

14. The fuel injection system according to claim 13, wherein the parameter is a temperature of an engine coolant, and the increasing rate decreases as the temperature of the engine coolant increases.

15. The fuel injection system according to claim 13, wherein the parameter is at least one parameter selected from an opening amount of an intake passage control valve provided in an intake port, a valve overlap amount between an intake valve and an exhaust valve, an assist air amount of an air assist type fuel injection valve, a temperature of fuel to be injected, and a temperature of intake air.

16. The fuel injection system according to claim 1, wherein the controller determines an increasing rate from an amount of fuel to be injected into the one of the cylinders in the first injection of the first cycle to an amount of fuel to be injected into the rest of the cylinders during the first cycle, and the controller determines a decreasing rate from an amount of fuel to be injected into the one of the cylinders in a first injection of a second cycle following the first cycle to the amount of fuel to be injected into the rest of the cylinders during the second cycle based on the increasing rate.

17. The fuel injection system according to claim 1, wherein the controller determines an amount of fuel to be next injected into any one of the cylinders based on a rate of an increase in an engine speed resulting from an ignition of fuel which is injected into a different one of the cylinders at an earlier time during the first cycle.

18. The fuel injection system according to claim 1, wherein the controller determines a fuel injection amount in the first cycle of a next engine start based on an increasing rate of an engine speed obtained during a present engine start.

19. The fuel injection system according to claim 1, wherein the cylinders in the internal combustion engine comprise at least four cylinders.

20. A control method of a fuel injection system for an internal combustion engine that includes a plurality of cylinders, comprising the step of:

setting an amount of fuel injected into each cylinder sequentially in a first cycle of fuel injection during a normal engine start in which an engine speed increases, such that an amount of fuel to be injected into one of the cylinders in a last injection within the first cycle is larger than an amount of fuel to be injected into another one of the cylinders in a first injection within the first cycle.

21. The control method according to claim 20, further comprising the step of:

setting the fuel injection amount for each of the cylinders in the first cycle such that an amount of fuel to be injected into any one of the cylinders does not become smaller than an amount of fuel to be injected into another of the cylinders into which fuel is injected at an earlier time during the first cycle.

22. The control method according to claim 21, wherein an amount of fuel to be injected into each cylinder is progressively increased at each injection in the first cycle.

23. The control method according to claim 22, further comprising the step of:

progressively reducing an amount of fuel to be injected into each cylinder at each injection in a second cycle following the first cycle.

24. The control method according to claim 20, further comprising the step of:

setting an amount of fuel to be injected into each cylinder such that a total amount of fuel injected from the first cycle to a predetermined subsequent cycle is the same for all the cylinders.

25. The control method according to claim 24, further comprising the step of:

progressively reducing the amount of fuel to be injected into each cylinder in each cycle from the first cycle to the predetermined subsequent cycle.

26. The control method according to claim 24, wherein a total amount of fuel to be injected into each cylinder is a function of a parameter which affects evaporation of the injected fuel, and the total amount of the injected fuel decreases as the parameter changes in a direction that promotes the evaporation of the injected fuel.

27. The control method according to claim 26, wherein the parameter is a temperature of an engine coolant, and the total amount of the injected fuel decreases as the temperature of the engine coolant increases.

28. The control method according to claim 26, wherein the parameter is at least one parameter selected from an opening amount of an intake passage control valve provided in an intake port, a valve overlap amount between an intake valve and an exhaust valve, an assist air amount of an air assist type fuel injection valve, a temperature of fuel to be injected, and a temperature of intake air.

29. The control method according to claim 20, wherein a difference between the amount of fuel to be injected into the one of the cylinders in the first injection of the first cycle and the amount of fuel to be injected into the another one of the cylinders in the last injection of the first cycle is a function of a parameter which affects evaporation of the injected fuel, and the difference decreases as the parameter changes in a direction that promotes the evaporation of the injected fuel.

30. The control method according to claim 29, wherein the parameter is a temperature of an engine coolant, and the difference between the fuel injection amounts decreases as the temperature of the engine coolant increases.

31. The control method according to claim 29, wherein the parameter is at least one parameter selected from an opening amount of an intake passage control valve provided in an intake port, a valve overlap amount between an intake valve and an exhaust valve, an assist air amount of an air assist type fuel injection valve, a temperature of fuel to be injected, and a temperature of intake air.

32. The control method according to claim 20, wherein an increasing rate of the amount of fuel to be injected into the one of the cylinders in the last injection of the first cycle with respect to the amount of fuel to be injected into the another one of the cylinder in the first injection of the first cycle is a function of a parameter which affects evaporation of the injected fuel, and the increasing rate decreases as the parameter changes in a direction that promotes the evaporation of the injected fuel.

33. The control method according to claim 32, wherein the parameter is a temperature of an engine coolant, and the increasing rate decreases as the temperature of the engine coolant increases.

34. The control method according to claim 32, wherein the parameter is at least one parameter selected from an opening amount of an intake passage control valve provided in an intake port, a valve overlap amount between an intake valve and an exhaust valve, an assist air amount of an air assist type fuel injection valve, a temperature of fuel to be injected, and a temperature of intake air.

35. The control method according to claim 20, further comprising the steps of:

determining an increasing rate from the amount of fuel to be injected into the one of the cylinders in the first injection of the first cycle to the amount of fuel to be injected into the rest of the cylinders during the first cycle; and

determining a decreasing rate from the amount of fuel to be injected into the one of the cylinders in the first injection of a second cycle following the first cycle to the amount of fuel to be injected into the rest of the cylinders during the second cycle based on the increasing rate.

36. The control method according to claim 20, further comprising the step of:

determining an amount of fuel to be next injected into any one of the cylinders based on a rate of an increase in an engine speed resulting from an ignition of fuel which is injected into a different one of the cylinders at an earlier time during the first cycle.

37. The control method according to claim 20, further comprising the step of:

determining a fuel injection amount in the first cycle of a next engine start based on an increasing rate of an engine speed obtained during a present engine start.